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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,678	10/17/2003	Jin-Tau Huang	NTCP0016USA	2677
27765	7590	09/22/2005	EXAMINER	
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			EVERHART, CARIDAD	
			ART UNIT	PAPER NUMBER
			2891	
DATE MAILED: 09/22/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/605,678

Applicant(s)

HUANG ET AL.

Examiner

Caridad M. Everhart

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 10-15 is/are allowed.
- 6) ☐ Claim(s) 4-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1,6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw (US 6,448,140B1) in view of Gocho(US 6,258,654B1) and further in view of Ota et al (US 6,521,963B1).

Liaw discloses depositing a silicon dioxide gate insulator, a polysilicon layer, a tungsten silicide layer, and a hardmask of silicon nitride(col. 3, lines 50-65). These layers are etched to form a gate(col. 4, lines 6-15). The tungsten silicide layer is laterally recessed(col. 4, lines 57-67). Passivation is filled into the recess(col. 5, lines 30-35 and Fig. 4 features 9c). Photoresist is used to pattern the cap layer and the entire stack(col. 4, lines 13-20). APM is used to form the recesses (col. 4, lines 64-67). Spacers are formed from silicon nitride by anisotropic etch(col. 5, lines 20-36).

Liaw does not carry out the etch in two steps nor teach the stopping the etch at the polysilicon layer.

Gocho(US 6,258,654B1) is relied upon for its teaching of carrying out a tungsten silicide polysilicide etch in two steps, such that the polysilicon acts as an etch stop(col. 5, lines 65-67 and col. 6, lines 1-11).

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Ota et al teaches stopping the etch at the polysilicon layer in a process of forming an oxide in an indentation of a metal layer overlying the polysilicon(Fig. 14 and Fig.20 and col. 12, lines 62-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the two-step etch taught by Gocho in the process taught by Liaw because Liaw discloses that conventional etch procedures can be used, and the procedure used by Gocho would include the protection of the polysilicon layer while the tungsten nitride layer is being processed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the step taught by Ota in the process taught by Liaw in view of Gocho in order to protect the polysilicon layer.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw in view of Gocho and of Ota et al as applied to claim 1 above, and further in view of Curello(US 6,503,844B2).

Liaw in view of Gocho and of Ota et al does not teach removing the photoresist in order to use the cap layer as a hardmask.

Curello discloses the step of removing the photoresist in order to use the cap layer as a hardmask(col. 4, lines 15-25 and Fig. 3A, feature 54 is the hardmask).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the steps taught by Curello with the process taught by Liaw because the cap layer in the process taught by Liaw could have been used as a

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hardmask without the photoresist layer remaining on the patterned cap layer, and the material of the cap is the same in the process taught by Liaw and in the steps taught by Curello.

***Allowable Subject Matter***

Claims 10-15 are allowed.

The prior art of record does not teach or suggest the anisotropic etch to remove the fill layer of the recess except that in the recess in combination with the other limitations of the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

A handwritten signature consisting of a wavy line followed by two parallel diagonal slashes, followed by another wavy line and another set of two parallel diagonal slashes, and finally a long horizontal wavy line.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
CARIDAD EVERHART  
PRIMARY EXAMINER

C. Everhart  
9-19-2005